All India Test Series (2023-24)

Test Code: ANY/11 | **AITS TEST - 11** | **YAKEEN NEET**

DURATION: 200 Minutes | **DATE: 25/04/2024** | **M. MARKS: 720**

ANSWER KEY

(PHYSICS)

SECTION-A

1.	(2)	8.	(3)	15.	(2)	22.	(3)	29.	(2)
2.	(3)	9.	(1)	16.	(1)	23.	(1)	30.	(1)
3.	(3)	10.	(2)	17.	(1)	24.	(3)	31.	(3)
4.	(4)	11.	(4)	18.	(1)	25.	(1)	32.	(2)
5.	(4)	12.	(2)	19.	(4)	26.	(1)	33.	(3)
6.	(1)	13.	(2)	20.	(2)	27.	(4)	34.	(2)
7.	(2)	14.	(3)	21.	(2)	28.	(2)	35.	(1)

SECTION-B

36.	(4)	39.	(3)	42.	(1)	45.	(1)	48.	(3)
37.	(3)	40.	(3)	43.	(3)	46.	(3)	49.	(1)
38.	(2)	41.	(3)	44.	(4)	47.	(4)	50.	(3)

(CHEMISTRY)

SECTION-A

51.	(1)	58.	(3)	65.	(4)	72.	(2)	79.	(1)
52.	(4)	59.	(3)	66.	(1)	73.	(4)	80.	(4)
53.	(1)	60.	(2)	67.	(1)	74.	(1)	81.	(4)
54.	(1)	61.	(1)	68.	(4)	75.	(4)	82.	(2)
55.	(2)	62.	(3)	69.	(4)	76.	(2)	83.	(2)
56.	(1)	63.	(4)	70.	(2)	77.	(4)	84.	(2)
57.	(4)	64.	(4)	71.	(1)	78.	(4)	85.	(3)

SECTION-B

86.	(4)	89.	(1)	92.	(1)	95.	(2)	98.	(2)
87.	(4)	90.	(4)	93.	(3)	96.	(3)	99.	(4)
88.	(4)	91.	(3)	94.	(1)	97.	(2)	100.	(1)

(BOTANY)

SECTION-A

101.	(2)	108.	(1)	115.	(1)	122.	(1)	129.	(1)
102.	(3)	109.	(3)	116.	(2)	123.	(4)	130.	(4)
103.	(2)	110.	(2)	117.	(1)	124.	(2)	131.	(3)
104.	(2)	111.	(1)	118.	(2)	125.	(3)	132.	(3)
105.	(3)	112.	(4)	119.	(3)	126.	(3)	133.	(3)
106.	(3)	113.	(1)	120.	(2)	127.	(2)	134.	(3)
107.	(4)	114.	(4)	121.	(2)	128.	(1)	135.	(3)

SECTION-B

136.	(4)	139.	(2)	142.	(1)	145.	(3)	148.	(1)
137.	(3)	140.	(3)	143.	(4)	146.	(3)	149.	(2)
138.	(3)	141.	(2)	144.	(2)	147.	(4)	150.	(1)

(ZOOLOGY)

SECTION-A

151.	(1)	158.	(3)	165.	(4)	172.	(2)	179.	(3)
152.	(2)	159.	(1)	166.	(2)	173.	(3)	180.	(2)
153.	(2)	160.	(1)	167.	(2)	174.	(1)	181.	(3)
154.	(3)	161.	(2)	168.	(1)	175.	(3)	182.	(1)
155.	(2)	162.	(3)	169.	(2)	176.	(3)	183.	(2)
156.	(4)	163.	(2)	170.	(1)	177.	(2)	184.	(1)
157.	(3)	164.	(3)	171.	(2)	178.	(2)	185.	(3)

SECTION-B

186.	(1)	189.	(1)	192.	(3)	195.	(2)	198.	(1)
187.	(1)	190.	(2)	193.	(1)	196.	(2)	199.	(3)
188.	(4)	191.	(3)	194.	(4)	197.	(4)	200.	(2)

Hints & Solutions

[AITS-11 || Yakeen-NEET || 25-04-2024]

(PHYSICS)

SECTION-A

1. (2)

$\phi \propto q$ (Initially) ….. (i)

After addition of charge 50 μC, new electric flux through surface is ϕ'.

$\phi' \propto q'$ ….. (ii)

$\frac{\phi'}{\phi} = \frac{q'}{q} = \frac{60}{10} = 6$

$\phi' = 6\phi$

Change in flux $\Delta\phi = \phi' - \phi = 5\phi$

(NEW NCERT 12th Page No. 29, 30)

2. (3)

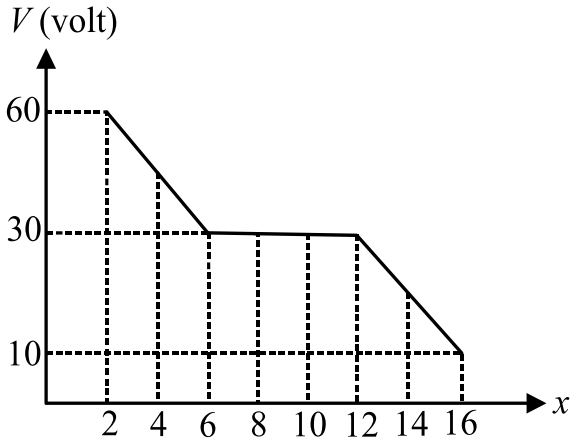
$mg - T = ma$ ....(i)

$T = m'a$ ….(ii)

$\therefore \quad a = \frac{mg}{m+m'}$

(NEW NCERT 11th Page No. 64, 65)

3. (3)



$\vec{E}_x = -\frac{dV}{dx}\hat{i}$ (– *ve* of slope of *V*-*x* curve)

Electric field at x = 14 *m* is

$= \frac{30-10}{16-12} = \frac{20}{4}\hat{i} = 5\hat{i}$ (v/m)

At x = 8m, slope of *v*-*x* graph is zero

$\therefore \quad E = 0\hat{i}$

(NEW NCERT 12th Page No. 55)

4. (4)

$At\ h' = \frac{h}{5}$

$PE = \frac{mgh}{5}$

$\therefore KE = mgh - \frac{mgh}{5} = \frac{4mgh}{5}$

$KE : PE = 4 : 1$

(NEW NCERT 11th Page No. 78, 79)

5. (4)

$\frac{1R}{1+R} = \frac{4}{5}$

$5R = 4 + 4R$

$R = 4\ \Omega$

6. (1)

$x = ct^3 + \frac{b}{t}$

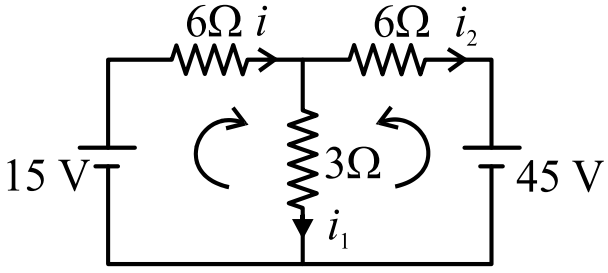
$[x] = [ct^3] = \left[\frac{b}{t}\right]$

$c = [L^1T^{-3}]; b = [L^1T^1]$

$\sqrt{cb} = \sqrt{[L^2T^{-2}]} = [L^1T^{-1}]$

(NEW NCERT 11th Page No. 8, 9)

7. (2)



Using *KVL*

$15 - 6i - 3i_1 = 0$ ….. (i)

$45 + 6i_2 - 3i_1 = 0$ ….. (ii)

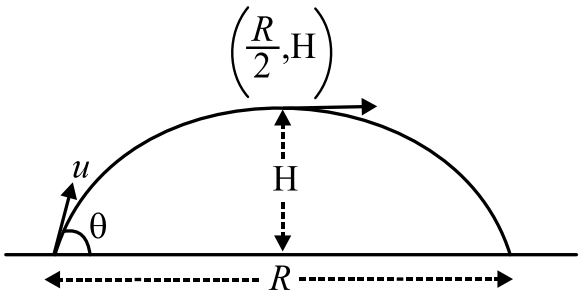
Also, $i = i_1 + i_2$ ….. (iii)

Solving (i), (ii) and (iii)

We get i_1 = 5A

(NEW NCERT 12th Page No. 97, 98)

8. **(3)**



For maximum range $\theta = 45^o$

Maximum height $H = \dfrac{u^2 \sin^2\theta}{2g}$ ….. (i)

Horizontal range, $R = \dfrac{u^2 \sin 2\theta}{g}$

$= \dfrac{2u^2 \sin\theta\cos\theta}{g}$ ….. (ii)

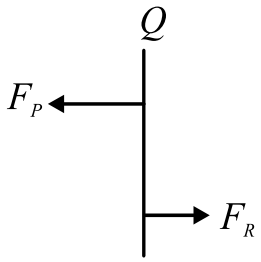
Divide (i) by (ii), we get $\tan\theta = \dfrac{4H}{R}$

$H = \dfrac{R}{4}\tan 45° = \dfrac{200}{4} = 50$

$\therefore \text{Required coordinates}\left(\dfrac{R}{2},H\right) = (100,50)$

(NEW NCERT 11th Page No. 38, 40)

9. **(1)**



$\dfrac{F_P}{\ell} = \dfrac{\mu_0 \times 6 \times 4}{2\pi r}$

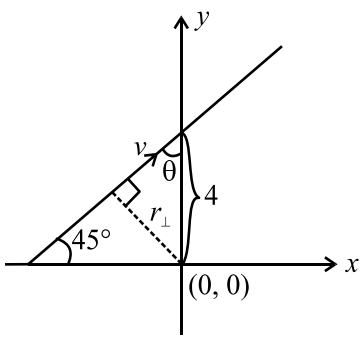
$\dfrac{F_R}{\ell} = \dfrac{\mu_0 \times 2 \times 4}{2\pi r}$

$F_P > F_R$

$F_{\text{net}} \Rightarrow (\text{towards left})$

(NEW NCERT 12th Page No. 122, 123)

10. **(2)**



$y = x + 4$

$c = 4 \quad \theta = 45°$

$r_\perp = c\sin\theta = 4 \times \dfrac{1}{\sqrt{2}} = 2\sqrt{2}$

$|L| = mvr_\perp = 3 \times \sqrt{2} \times 2\sqrt{2}$

$|L| = 12\,\text{kg m}^2/\text{s}$

(NEW NCERT 11th Page No. 106, 107)

11. **(4)**

If d_1 is the distance of point X on axial line and d_2 is distance of point Y on equatorial line, then

$B_1 = \dfrac{\mu_0 2M}{4\pi d_1^3}, B_2 = \dfrac{\mu_0 M}{4\pi d_2^3}$

As $B_1 = B_2$

$\therefore \quad \dfrac{\mu_0 2M}{4\pi d_1^3} = \dfrac{\mu_0 2M}{4\pi d_2^3}$

$d_1^3 = 2d_2^3; \dfrac{d_1}{d_2} = 2^{1/3}$

(NEW NCERT 12th Page No. 140)

12. **(2)**

$\Delta KE = \dfrac{1}{2}\dfrac{m_2 m_2}{(m_1 + m_2)}(1 - e^2)(u_1 - u_2)^2$

$\Delta KE = \dfrac{1}{2} \times \dfrac{m}{2}(1 - e^2)u^2 = \dfrac{1}{3} \times \left(\dfrac{1}{2}mu^2\right)$

$\Rightarrow \dfrac{1 - e^2}{2} = \dfrac{1}{3} \Rightarrow e^2 = \dfrac{1}{3} \Rightarrow e = \dfrac{1}{\sqrt{3}}$

13. **(2)**

Use $V_S^2 = V_R^2 + V_C^2$

$(40)^2 = (24)^2 + V_C^2$

$V_C = 32\,\text{V}$

(NEW NCERT 12th Page No. 187)

14. **(3)**

Shearing stress $\tau = \eta\left(\dfrac{\Delta v}{\Delta y}\right)$

$10^{-3}\left(\dfrac{10 - 0}{20 - 0}\right)$

$= \dfrac{1}{2} \times 10^{-3}$

$= 0.5 \times 10^{-3}\,\text{N/m}^2$

(NEW NCERT 11th Page No. 191)

15. **(2)**

Here, $x_1 = 25$ cm, $x_2 = 40$ cm

According to Newton's formula

$$f^2 = x_1 x_2 = (25)(40)$$

$$f = \sqrt{(25)(40)} = 10\sqrt{10}\,\text{cm} \simeq 32\,\text{cm}$$

Object distance,

$$u = -(f + x_1) = -(32 + 25)\,\text{cm} = -57\,\text{cm}$$

Image distance,

$$v = (f + x_2) = (32 + 40)\,\text{cm} = 72\,\text{cm}$$

Magnification, $m = \dfrac{v}{u} = \dfrac{72}{-57} = -1.3$

(NEW NCERT 12th Page No. 235, 236)

16. **(1)**

$$PE = \frac{-GMm}{R}$$

$$-64 = \frac{-GM \times 2}{R} \Rightarrow \text{Hence,} \frac{GM}{R} = 32$$

but $V_{esc} = \sqrt{\dfrac{2GM}{R}} = \sqrt{64} = 8\,\text{m/s}$

(NEW NCERT 11th Page No. 134, 136)

17. **(1)**

For Central fringe at same position,

$\because$ Path difference $(\Delta x) = 0$

Now $(\mu_1 - 1)t_1 = (\mu_2 - 1)t_2$

$$(1.8 - 1) \times 1.5 = (3.5 - 1) \times t_2$$

$$t_2 = \frac{0.8 \times 1.5}{2.5} = 0.48\,\text{mm}$$

(NEW NCERT 12th Page No. 265, 266)

18. **(1)**

$$Q_1 = \Delta U_1 + W_1$$

$$\Delta U_1 = 16 - 30 = -14\,\text{kJ}$$

$$Q_2 = \Delta U_2 + W_2$$

$$W_2 = Q_2 - \Delta U_2 \qquad (\because \Delta U_1 = \Delta U_2)$$

$$= 18 - (-14) = 32\,\text{kJ}$$

(NEW NCERT 11th Page No. 230)

19. **(4)**

$$\lambda = \frac{h}{mv}$$

$$\therefore \quad \frac{\lambda_2}{\lambda_1} = \frac{m_1 v_1}{m_2 v_2} = \frac{m_1 v_1}{(2m_1)(2v_1)} = \frac{1}{4}$$

$$\therefore \quad \lambda_2 = \frac{\lambda_1}{4}$$

$$\text{New wavelength} = \frac{\text{original wavelength}}{4}$$

$\therefore$ The wavelength decrease by a factor more than 2.

(NEW NCERT 12th Page No. 285, 286)

20. **(2)**

$$R_{eq} = R_1 + R_2$$

$$\frac{2L}{K_{eq} A} = \frac{L}{2KA} + \frac{L}{4KA} \Rightarrow K_{eq} = \frac{8}{3} K$$

(NEW NCERT 11th Page No. 215, 216)

21. **(2)**

$$T.E. = = \frac{13.6 Z^2}{n^2} = \frac{-13.6 \times 1}{4}$$

$K.E. = -T.E. = -(-3.4\ \text{eV})$

$= 3.4$ eV

(NEW NCERT 12th Page No. 299)

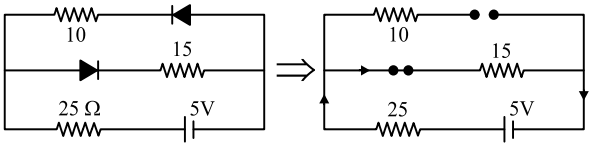
22. **(3)**

Fundamental frequency of open organ pipe

$$n = \frac{v}{2\ell} = \frac{330}{2 \times 0.55} = 300\,\text{Hz}$$

(NEW NCERT 11th Page No. 291, 293)

23. **(1)**



$$I = \frac{5}{40} A$$

(NEW NCERT 12th Page No. 334, 335)

24. **(3)**

$$\gamma = \frac{C_P}{C_V} = \frac{C_V + R}{C_V} = \frac{\frac{1}{2} fR + R}{\frac{1}{2} fR}$$

$$= \frac{f + 2}{f}$$

$$\Rightarrow \quad \gamma f - f = 2 \Rightarrow f = \frac{2}{\gamma - 1}$$

(NEW NCERT 11th Page No. 253)

25. **(1)**

$$V = \frac{Q}{4\pi\varepsilon_0 \sqrt{R^2 + x^2}} = \frac{\lambda \times 2\pi R}{4\pi\varepsilon_0 \sqrt{R^2 + x^2}}$$

$$= \frac{\lambda \times 2\pi R}{4\pi\varepsilon_0 \sqrt{R^2 + 8R^2}}$$

$$= \frac{\lambda}{6\varepsilon_0}$$

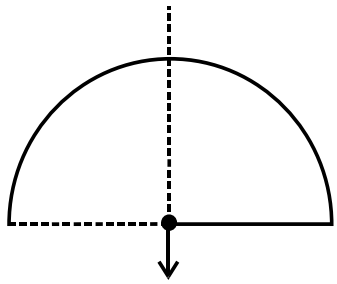
(NEW NCERT 12th Page No. 47, 48)

26. (1)

$$A=\ell^2 \Rightarrow \frac{\Delta A}{A}\times 100 = 2\frac{\Delta \ell}{\ell}\times 100 = 2(1.5\%) = 3\%$$

(NEW NCERT 11th Page No. 204, 207)

27. (4)



$$= \frac{2kQ}{\pi R^2} = \frac{2\times 9\times 10^9 \times 4.2\times 10^{-9}}{3.14\times 1\times 1}$$

= 24 V/m

(NEW NCERT 12th Page No. 14, 16)

28. (2)

Slope of *x-t* curve is equal to velocity.

When slope of *x-t* curve is zero, velocity will be zero and at point *B*, slope is zero, so velocity is zero.

(NEW NCERT 11th Page No. 14)

29. (2)

$$C = \frac{\in_0 A}{d} = 10\mu F$$

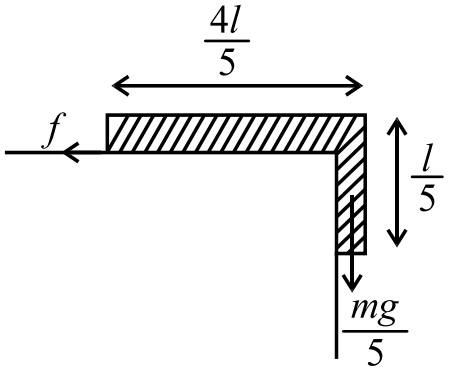
$$C_1 = \frac{K_1 \in_0 A}{2d} = 15\ \mu F$$

$$C_2 = \frac{K_2 \in_0 A}{2d} = 25\ \mu F$$

$$C_{eq} = C_1 + C_2 = 40\ \mu F$$

(NEW NCERT 12th Page No. 69, 72)

30. (1)



$$f = \frac{\mu \times 4mg}{5}$$

$$\mu \times \frac{4m}{5} g = \frac{m}{5} g \Rightarrow \mu = \frac{1}{4}$$

(NEW NCERT 11th Page No. 60, 61)

31. (3)

$\because \quad \mu = \tan\theta_P$

$\therefore \quad = \tan 60 = \sqrt{3}$

Now $\mu = \frac{c}{v}$

$$v = \frac{c}{\mu} = \frac{3\times 10^8}{\sqrt{3}}$$

$$v = \sqrt{3}\times 10^8 \text{ m/s}$$

(NEW NCERT 12th Page No. 269, 270)

32. (2)

$\vec{a} = 4\hat{i} + 2\hat{j}$

$\vec{p} = 8\hat{i} - 5\hat{j}$

$\vec{a}.\vec{p} = 32 - 10 = 22 > 0$

$\Rightarrow$ as angle between $\vec{a}$ and $\vec{v}$ is acute so it is accelerated circular motion.

(NEW NCERT 11th Page No. 40, 42)

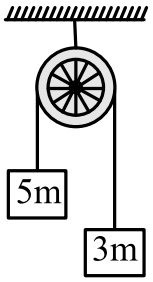
33. (3)

Energy released = binding energy of products – binding energy of reactants

$= c - (a + b) = c - a - b$

(NEW NCERT 12th Page No. 315)

34. (2)



$$a = \frac{(5m-3m)}{5m+3m} g = \frac{g}{4}$$

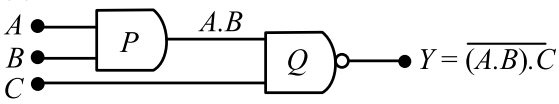
$$|\vec{a}_{cm}| = \frac{5m\vec{a}_1 + 3m\vec{a}_2}{5m+3m}$$

Both mass have same magnitude of acceleration but in opposite direction $(\vec{a}_1 = -\vec{a}_2)$

$$a_{cm} = \left(\frac{5m-3m}{8m}\right)\times\frac{g}{4} = \frac{g}{16}$$

(NEW NCERT 11th Page No. 99)

35. (1)



For A = B = C = 0; *Y* = 1

For A = B = C = 1; *Y* = 0

(OLD NCERT 12th Page No. 501, 505)

SECTION-B

36. (4)

$I_{net} = m(0)^2 + m(2a)^2 + m(2a)^2 + m(4a)^2$

$= 4ma^2 + 4ma^2 + 16ma^2$

$= 24ma^2$

(NEW NCERT 11th Page No. 95, 98)

37. (3)

$(K.E.)_{max} = h\nu - \phi_0$

= 5 eV – 3 eV = 2 eV

(NEW NCERT 12th Page No. 281)

38. (2)

Inside hollow sphere, potential is same as that on surface.

So, $V_A = V_B = V_O$

39. (3)

$f = \frac{1}{2\pi\sqrt{LC}}$

Now, $L' = L + \frac{L}{4} = \frac{5L}{4}$

$C' = C - \frac{C}{5} = \frac{4C}{5}$

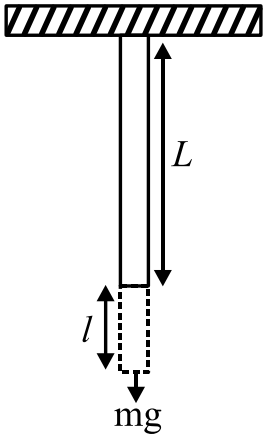
$f' = \frac{1}{2\pi\sqrt{L'C'}} = \frac{1}{2\pi\sqrt{\frac{5L}{4} \times \frac{4C}{5}}}$

$f' = \frac{1}{2\pi\sqrt{LC}} = f$

(NEW NCERT 12th Page No. 188, 189)

40. (3)

When strain is small, the ratio of the longitudinal stress to the corresponding longitudinal strain is called Young's modulus (Y) of the material of the body.



$Y = \frac{\text{stress}}{\text{strain}} = \frac{F/A}{\Delta\ell/L} = \frac{F.L}{\pi r^2 \Delta\ell}$

$Given, Y_1 = 7 \times 10^{10}\ \text{N/m}^2$

$Y_2 = 12 \times 10^{10}\ \text{N/m}^2$

$D_1 = 4\,mm$

$\therefore \frac{Y_2}{Y_1} = \left(\frac{D_1}{D_2}\right)^2$

$\Rightarrow \frac{12 \times 10^{10}}{7 \times 10^{10}} = \left(\frac{4}{D_2}\right)^2$

$\Rightarrow \frac{4}{D_2} = \sqrt{\frac{12}{7}}$

$D_2 = 4\sqrt{\frac{7}{12}} \approx 3\text{mm}$

(NEW NCERT 11th Page No. 170, 171)

41. (3)

From one side

$(d_{app})_1 = \frac{(d_{ac})_1}{\mu}$

$(d_{ac})_1 = \mu(d_{app})_1 = 1.5 \times 6 = 9\,\text{cm}$

From other side

$(d_{ac})_2 = \mu(d_{app})_2 = 1.5 \times 4 = 6\,\text{cm}$

Total $d_{ac} = (d_{ac})_1 + (d_{ac})_2 = 9 + 6$

= 15 cm

(NEW NCERT 12th Page No. 228, 229)

42. (1)

Time period of revolution for moving charge *q* and mass *m* with velocity *v* in uniform magnetic field *B* is given by

$T = \frac{2\pi m}{qB}$

Here, we can see that *T* is independent on *v*.

So, for any velocity, time period will remain same.

(NEW NCERT 12th Page No. 112)

43. (3)

For maximum power $R_{internal} = R_{ext}$.

(NEW NCERT 12th Page No. 92, 94)

44. (4)

For adiabatic process

$P^{1-\gamma}T^{\gamma} = \text{constant}$

$P \propto T^{\left(\frac{-\gamma}{1-\gamma}\right)} \propto T^{\left(\frac{\gamma}{\gamma-1}\right)}$

as per question $P \propto T^C$

on comparing

$$C=\frac{\gamma}{\gamma-1}=\frac{\frac{7}{5}}{\frac{7}{5}-1}=\frac{7}{2}$$

(NEW NCERT 11th Page No. 235)

45. (1)

The decreasing order of wavelength is:

Microwave > infrared rays > UV rays> gamma rays.

(NEW NCERT 12th Page No. 208, 209)

46. (3)

$$v\propto\sqrt{\frac{T}{M_W}}$$

$$\frac{v_1}{v_2}=\sqrt{\frac{T_1}{T_2}\times\frac{M_{W_2}}{M_{W_1}}}$$

$$\frac{3860}{v_2}=\sqrt{\frac{300}{1200}\times\frac{32}{2}}$$

$$\frac{3860}{v_2}=\sqrt{4}\Rightarrow\frac{3860}{v_2}=2$$

$$v_2=\frac{3860}{2}=1930\,\text{m/s}$$

(NEW NCERT 11th Page No. 250, 251)

47. (4)

$$B=\frac{\mu_0 i}{2r}\Rightarrow i=\frac{2Br}{\mu_0}$$

$$i\propto Br\Rightarrow\frac{i_1}{i_2}=\frac{B_1r_1}{B_2r_2}=\frac{1}{4}\times\frac{1}{3}=\frac{1}{12}$$

(NEW NCERT 12th Page No. 115, 117)

48. (3)

$n\propto\sqrt{T}$, If T decreases, frequency will decrease.

(NEW NCERT 11th Page No. 285)

49. (1)

$$e=\frac{d\phi}{dt}=\frac{d\left(BA\cos 0°\right)}{dt}=A_0\frac{dB}{dt}$$

$$=A_0\frac{\left(4B_0-B_0\right)}{t}=\frac{3A_0B_0}{t}$$

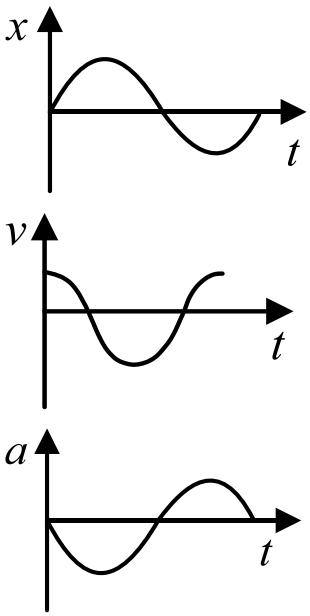
(NEW NCERT 12th Page No. 157, 159)

50. (3)

$$x=a\sin\omega t$$

$$v=\frac{dx}{dt}=a\,\omega\cos\omega t$$

$$a=-\omega^2x=-\omega^2a\sin\omega t$$



(NEW NCERT 11th Page No. 266, 267)

(CHEMISTRY)

SECTION-A

51. (1)

The electron configuration of Mn^{2+} is $[Ar]3d^5$

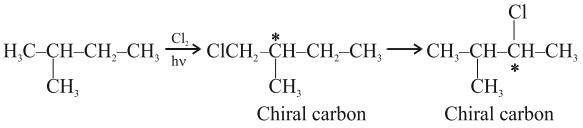
So, n = 5

spin only magnetic moment $(\mu) = \sqrt{n(n+2)}$ B.M.

$= \sqrt{5(5+2)} = \sqrt{35}$ B.M.

(NEW NCERT 12th Part-I Page No. 102)

52. (4)



So, here will be two pairs of enantiomers.

(NEW NCERT 11th Part-II Page No. 302)

53. (1)

S_4: Lactose is made up of β-D-glucose and β-D-galactose.

(NEW NCERT 12th Part-II Page No. 282,287,288)

54. (1)

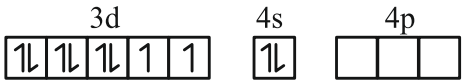
$[Pt(NH_3)_2Cl(NO_2)]$: Diamminechloridonitrito-N-platinum(II)

(NEW NCERT 12th Part-I Page No. 122)

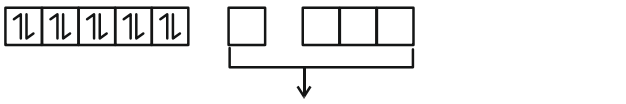
55. (2)

In $[Ni(CO)_4]$, oxidation number of Ni = 0

Ni(Z = 28)



In presence of CO two 4s electrons pair up

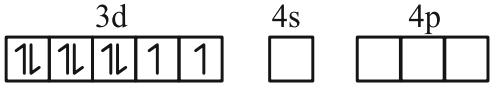


sp^3 Hybridisation (tetrahedral)

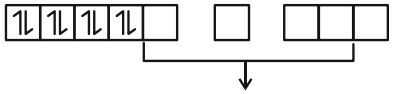
In $[Ni(CN)_4]^{2-}$

Oxidation number of Ni = +2

$Ni^{2+} \rightarrow 3d^8 4s^0 4p^0$



CN^- is strong field ligand, so pairing takes place



dsp^2 Hybridisation (Square planar)

(NEW NCERT 12th Part-I Page No. 128)

56. (1)

$CH_3CH_2CH_2Br \xrightarrow{KCN} CH_3CH_2CH_2CN \xrightarrow{LiAlH_4} CH_3CH_2CH_2CH_2NH_2$

(NEW NCERT 12th Part-II Page No. 263)

57. (4)

$$\lambda = \frac{hc}{E}$$

$$= \frac{6.63\times10^{-34}\times3\times10^{8}}{8.8\times10^{-12}} = 2.26\times10^{-14}\,m$$

(NEW NCERT 11th Part-I Page No. 48)

58. (3)

$$t_{1/2} = \frac{0.693}{k}$$

$$k = \frac{0.693}{6.93} = \frac{1}{10}$$

$$t = \frac{2.303}{k}\log\frac{[A_0]}{[A]}$$

$$t = \frac{2.303}{\frac{1}{10}}\log\left(\frac{100}{20}\right)$$

$t = 2.303 \times 10 \log 5$

$t = 2.303 \times 10 \times 0.699$

$t = 16.1$ min

(NEW NCERT 12th Part-I Page No. 73,76)

59. (3)

Let the total pressure at equilibrium be P

$NH_2COONH_4(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$

$\frac{2P}{3}$ $\quad$ $\frac{P}{3}$

$$K_p = \left[P_{NH_3}\right]^2\left[P_{CO_2}\right]$$

$$= \left(\frac{2P}{3}\right)^2\left(\frac{P}{3}\right) = \frac{4P^3}{27}$$

$K_p = 4 \times 10^{-6}$

$$\frac{4P^3}{27} = 4\times10^{-6}$$

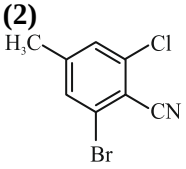
$$P^3 = \frac{27\times4\times10^{-6}}{4}$$

$P = 3 \times 10^{-2}$

$P = 0.03$ atm

(NEW NCERT 11th Part-I Page No. 178)

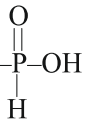
60. (2)

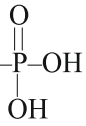


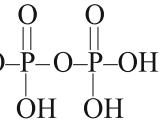
2-Bromo-6-chloro-4-methylbenzonitrile

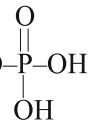
(NEW NCERT 11th Part-II Page No. 263)

61. (1)

Hypophosphorus acid : $H_3PO_2 \Rightarrow$ 

Phosphorus acid: $H_3PO_3 \Rightarrow$ 

Pyrophosphorus acid: $H_4P_2O_7 \Rightarrow$ 

Orthophosphoric acid: $H_3PO_4 \Rightarrow$ 

(OLD NCERT 13th Part-I Page No. 179)

62. (3)

$P_T = P_A^0 X_A + P_B^0 X_B$

$400X_A + (1 - X_A) \times 800 = 760$

$-400X_A = 760 - 800$

$-400X_A = -40$

$X_A = \frac{40}{400} = \frac{1}{10} = 0.1$

% of $X_A = 10\%$

(NEW NCERT 12th Part-I Page No. 10)

63. (4)

	A	+	B	→	C	+	D
Initial	a		a		0		0
At eqn.	a–x		a–x		x		x

Given: at eq^m, [D] = 2[A]

$x = 2(a - x)$

$\therefore\ x = \frac{2a}{3}$

$\therefore K_C = \frac{x \times x}{(a-x)(a-x)} = \frac{\left(\frac{2a}{3}\right)^2}{\left(a - \frac{2a}{3}\right)^2} = \frac{\left(\frac{2a}{3}\right)^2}{\left(\frac{a}{3}\right)^2} = 4$

$K_C = 4$

(NEW NCERT 11th Part-I Page No. 176)

64. (4)

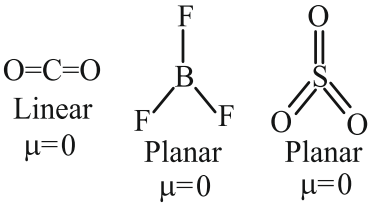
$Zn + \underset{(conc.)}{4HNO_3} \rightarrow Zn(NO_3)_2 + \underset{(X)}{2NO_2} + 2H_2O$

$4Zn + \underset{(dilute)}{10HNO_3} \rightarrow 4Zn(NO_3)_2 + \underset{(Y)}{N_2O} + 5H_2O$

$X = NO_2$, $Y = N_2O$

(OLD NCERT 12th Part-I Page No. 174)

65. (4)



(NEW NCERT 11th Part-I Page No. 111)

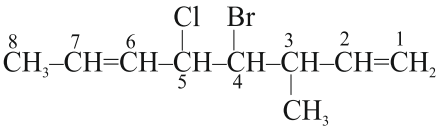
66. (1)

Arylamines are less basic then Aliphatic amines because unshared electron pair on nitrogen atom is delocalized in the ring making it less available for protonation. so due to electron releasing nature of alkyl group the order of basic nature is.

A < D < B < C

(NEW NCERT 12th Part-II Page No. 268)

67. (1)



(1) 4-Bromo-5-chloro-3-methylocta-1,6-diene

(NEW NCERT 11th Part-II Page No. 263)

68. (4)

The complex $[Co(NH_3)_6]^{3+}$ is diamagnetic and low spin in nature.

(NEW NCERT 12th Part-I Page No. 129)

69. (4)

$NH_4NO_3 \rightarrow N_2O + 2H_2O$

$\overset{+5}{NO_3^-} \rightarrow \overset{+1}{N_2}O$

$\overset{-3}{NH_4^+} \rightarrow \overset{+1}{N_2}O$

Oxidation number of N changes +5 to +1 and –3 to +1

(NEW NCERT 11th Part-II Page No. 239)

70. (2)

100 ml of 41.6% $BaCl_2$ solution = 41.6 g $BaCl_2$

50 ml of 19.6% H_2SO_4 solution = 9.8 g H_2SO_4

$\underset{1\,mole}{BaCl_2} + \underset{1\,mole}{H_2SO_4} \rightarrow \underset{1\,mole}{BaSO_4} + \underset{2\,mole}{2HCl}$

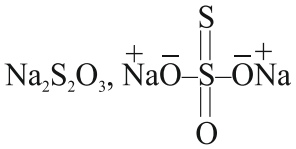
$\therefore$ 98 g H_2SO_4 will produce = 233 g $BaSO_4$

$\therefore$ 9.8 g H_2SO_4 will produce $= \frac{233 \times 9.8}{98}$ g $BaSO_4$

= 23.3 g $BaSO_4$

(NEW NCERT 11th Part-I Page No. 20)

71. (1)



No S–S single bond

One S=S double bond in $Na_2S_2O_3$

(OLD NCERT 12th Part-I Page No. 189)

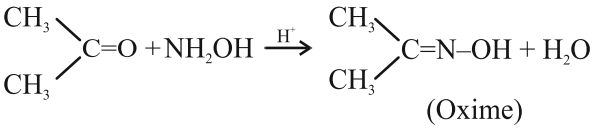
72. (2)

$\kappa = G \times G^*$

$$G = \frac{\kappa}{G^*} = \frac{0.029}{0.1} = 0.29\,\Omega^{-1}$$

(NEW NCERT 12th Part-I Page No. 44)

73. (4)



(Oxime)

(NEW NCERT 12th Part-II Page No. 238)

74. (1)

$\pi = iCRT$

For 0.2M glucose $\pi = 1 \times 0.2 \times RT = 0.2RT$

For 0.1M NaCl, i = 2

$\pi = 2 \times 0.1 \times RT$

$\pi = 0.2RT$

For 0.1M $BaCl_2$, i = 3

$\pi = 3 \times 0.1 \times RT = 0.3RT$

For 0.2M $AlCl_3$ i = 4

$\pi = 4 \times 0.2 \times RT$

$= 0.8RT$

(NEW NCERT 12th Part-I Page No. 21)

75. (4)

$$m = \frac{1000 \times M}{1000d - M \times M.M}$$

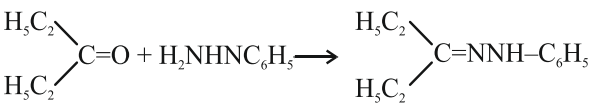
$$m = \frac{1000 \times 2}{1000 \times 1.30 - 2 \times 58.5}$$

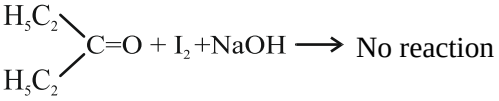
$$m = \frac{2000}{1183} = 1.69\,m$$

(NEW NCERT 11th Part-I Page No. 24)

76. (2)

(X)





Ketones does not give Tollen's test.

(NEW NCERT 12th Part-II Page No. 232)

77. (4)

$CH_3CH(Br)CH(Br)CH_3$

Total number of sigma bonds = 13

(NEW NCERT 11th Part-II Page No. 270)

78. (4)

The hybiridisation of each carbon in graphite is sp^2 and in graphite the electrons are delocalized over the whole sheet therefor graphite conducts electricity.

(OLD NCERT 11th Part-II Page No. 318)

79. (1)

Fullerenes are the only pure form of carbon and they have dangling bonds and Buckminster Fullerene contains six and five membered rings of carbon atoms.

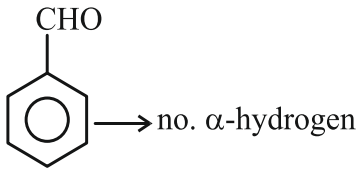
(OLD NCERT 11th Part-II Page No. 318)

80. (4)

Cannizzaro reaction is given by aldehydes with No α-hydrogen atom.

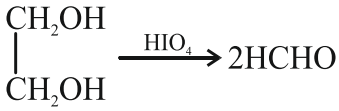
(1) $(CH_3)_3CCHO \rightarrow$ No α-hydrogen

(2) $HCHO \rightarrow$ No α-hydrogen

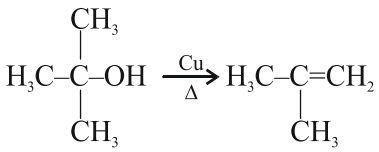
(3) 

(NEW NCERT 12th Part-II Page No. 252)

81. (4)

(1) 

(2) CH_3OH is also called wood spirit

(3) 

(4) Hoffmann bromamide reaction produced 1° amines.

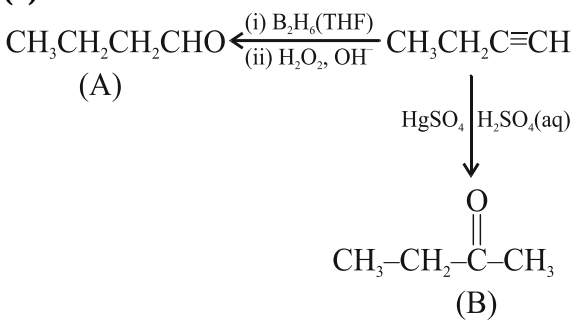
(NEW NCERT 12th Part-II Page No. 210,215)

82. (2)

IE_5 >>> IE_4 i.e it should be very difficult to remove 5th electron after removing four electrons from the element which will be only in the case of silicon.

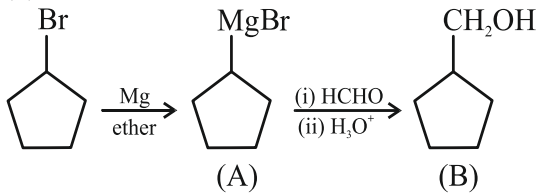
(NEW NCERT 11th Part-I Page No. 88)

83. (2)



(NEW NCERT 11th12th Part-II Page No. 200,317)

84. (2)



(NEW NCERT 12th Part-II Page No. 201)

85. (3)

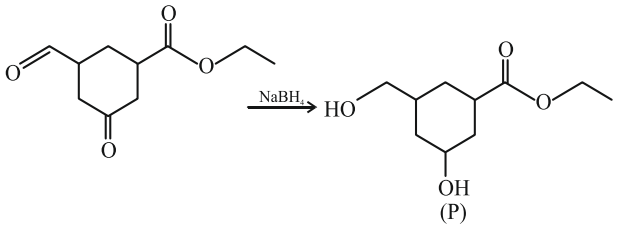
The electronic configuration of an element with atomic number 57 is $[Xe]^{54}6s^25d^1$

Since last electron enter into d-orbitals so, it is a d-block element.

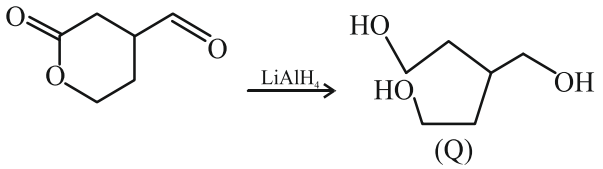
(NEW NCERT 11th Part-I Page No. 84)

SECTION-B

86. (4)



$NaBH_4$ does not reduced ester group.



$LiAlH_4$ reduces aldehyde, ketones, carboxylic acids and esters to alcohols so, there are five alcoholic groups in P and Q.

(NEW NCERT 12th Part-II Page No. 200)

87. (4)

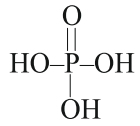
(A) $HCOOH(pk_a = 3.77)$ is stronger acid than $CH_3COOH(pk_a = 4.78)$

(B) $HCOOH + \left[Ag(NH_3)_2\right]^+ + 2OH^- \rightarrow$ positive test

(C) $HCOOH \xrightarrow[\Delta]{H_2SO_4} H_2O + CO$

(NEW NCERT 12th Part-II Page No. 239,251)

88. (4)

H_3PO_4, 

Basicity of H_3PO_4 is three and (P = O) bond is one

(OLD NCERT 12th Part-I Page No. 179)

89. (1)

For spontaneous process, total entropy change should be positive.

$\Delta S_{sys} + \Delta S_{surr} > 0$

(NEW NCERT 11th Part-I Page No. 160)

90. (4)

(1) $[Ti(NO_3)_4]$

$Ti^{4+} \rightarrow [Ar]3d^04s^0$

No unpaired electron so, colourless.

(2) $\left[Cu(NCCH_3)_4\right]^+BF_4^-$

$Cu^+ \rightarrow [Ar]3d^{10}4s^0$

No unpaired electron so, colourless.

(3) $[Co(NH_3)_6]Cl_3$

$Co^{3+} \rightarrow [Ar]3d^64s^0$

No unpaired electron so, colourless.

(4) $K_3[VF_6]$

$V^{3+} \rightarrow [Ar]3d^24s^0$

Two unpaired electron so, coloured.

(NEW NCERT 12th Part-I Page No. 133)

91. (3)

$[H^+] = 10^{-pH} = 10^{-4}M$

$HA(aq) \rightleftharpoons H^+(aq) + A^-(aq)$

Initial	0.2	0	0
At eqn.	$(0.2–10^{-4})$	10^{-4}	10^{-4}
	= 0.2		

$$K_a = \frac{\left[H^+\right][A]}{[HA]} = \frac{10^{-4}\times10^{-4}}{0.2} = 5\times10^{-8}$$

(NEW NCERT 11th Part-I Page No. 194)

92. **(1)**

$n_2 = 6, n_1 = 2$

Maximum number of spectral line

$$= \frac{(n_2 - n_1)(n_2 - n_1 + 1)}{2}$$

$$= \frac{(6-2)(6-2+1)}{2} = 10$$

(NEW NCERT 11th Part-I Page No. 46)

93. **(3)**

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

$$= \frac{6.63 \times 10^{-34} \times 3600}{0.5 \times 10}$$

$= 4.77 \times 10^{-31}$ m

(NEW NCERT 11th Part-II Page No. 50)

94. **(1)**

$$\text{Rate of reaction} = \frac{-1}{2}\frac{\Delta[N_2O_5]}{\Delta t} = \frac{1}{4}\frac{\Delta[NO_2]}{\Delta t}$$

$$= \frac{1}{4} \times \frac{4.4 \times 10^{-2}}{100}$$

$$= 1.1 \times 10^{-4} \text{ M / sec}$$

(NEW NCERT 12th Part-I Page No. 65)

95. **(2)**

$\Delta S = 32$ J mol^{-1} K^{-1}

$\Delta H_V = 12$ kJ mol^{-1}

$$T_{bp} = \frac{\Delta H_{vapour}}{\Delta S_{vapour}}$$

$$= \frac{12 \times 1000}{32}$$

$T_{bp} = 375$K

(NEW NCERT 11th Part-I Page No. 161)

96. **(3)**

$$H^+ + e^- \rightarrow \frac{1}{2}H_2$$

$$E = E° - \frac{0.059}{1}\log\frac{\sqrt{P_{H_2}}}{[H^+]}$$

For negative E, $\sqrt{P_{H_2}} > [H^+]$ or $P_{H_2} > [H^+]^2$

$$E = 0 - 0.059 \log \frac{\sqrt{2}}{1}$$

$$E = -0.059 \times \frac{1}{2}\log 2$$

$$E = -0.059 \times \frac{1}{2} \times 0.3010$$

$E = -0.009$ V

(NEW NCERT 12th Part-I Page No. 39)

97. **(2)**

$$CH_3COOH \xrightarrow{LiAlH_4} CH_3CH_2OH \xrightarrow[300°C]{Cu} CH_3CHO$$

(X) (Y)

$$\xrightarrow[(ii)\ \Delta]{(i)\ \text{dil.NaOH}} \underset{\text{But-2-enal}}{CH_3CH{=}CHCHO}$$

(Z)

(NEW NCERT 12th Part-II Page No. 241)

98. **(2)**

Species	**Hybrid orbital (σ bond + l.p)**
NH_3	$\Rightarrow 3 + 1 = 4\ (sp^3)$
PCl_5	$\Rightarrow 5 + 0 = 5\ (sp^3d)$
XeF_4	$\Rightarrow 4 + 2 = 6\ (sp^3d^2)$
IF_7	$\Rightarrow 7 + 0 = 7\ (sp^3d^3)$

(NEW NCERT 11th Part-I Page No. 124)

99. **(4)**

(1) $3\overset{+1}{H_3}\overset{}{P}O_2 \rightarrow 2\overset{+3}{H_3}\overset{}{P}O_3 + \overset{-3}{P}H_3$

(2) $3\overset{0}{Cl_2} + 6OH^- \rightarrow 5\overset{-1}{Cl^-} + \overset{+5}{Cl}O_3^- + 3H_2O$

(3) $2\overset{-1}{H_2}\overset{}{O_2} \rightarrow 2\overset{-2}{H_2}\overset{}{O} + \overset{0}{O_2}$

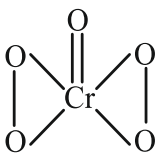
(4) $\overset{-4}{C}H_4 + 2\overset{0}{O_2} \rightarrow \overset{+4}{C}O_2 + 2\overset{-2}{H_2}\overset{}{O}$

Since different elements are oxidised and reduced so it is not a disproportionation reaction.

(NEW NCERT 11th Part-II Page No. 270)

100. **(1)**

CrO_5 :



$x + (-2) \times 1 + (-1) \times 4 = 0$

$x = +6$

(NEW NCERT 11th Part-II Page No. 267)

(BOTANY)

SECTION-A

101. (2)

Potato and brinjal are two different species but both belong to the genus *Solanum*. Lion (*Panthera leo*), leopard (*P. pardus*) and tiger (*P. tigris*) with several common features, are all species of the genus *Panthera*. This genus differs from another genus *Felis* which includes cats.

Common Name	Biological Name	Genus	Family	Order	Class	Phylum/ Division
Man	*Homo sapiens*	*Homo*	Hominidae	Primata	Mammalia	Chordata
Housefly	*Musca domestica*	*Musca*	Muscidae	Diptera	Insecta	Arthropoda
Mango	*Mangifera indica*	*Mangifera*	Anacardiaceae	Sapindales	Dicotyledonae	Angiospermae
Wheat	*Triticum aestivum*	*Triticum*	Poaceae	Poales	Monocotyledonae	Angiospermae

(NEW NCERT 11th Page No.7, 8)

102. (3)

There are thousands of different eubacteria or 'true bacteria'. They are characterised by the presence of a rigid cell wall, and if motile, a flagellum. The cyanobacteria (also referred to as blue-green algae) have chlorophyll a similar to green plants and are photosynthetic autotrophs and are classified under kingdom Monera.

(NEW NCERT 11th Page No. 12)

103. (2)

Archaebacteria are special since they live in some of the most harsh habitats such as extreme salty areas (halophiles), hot springs (thermoacidophiles) and marshy areas (methanogens).

(NEW NCERT 11th Page No. 13)

104. (2)

Polysiphonia, *Porphyra*, *Gracilaria* and *Gelidium* are examples of red algae. *Ectocarpus*, *Dictyota*, *Laminaria*, *Sargassum* and *Fucus* are examples of brown algae.

(NEW NCERT 11th Page No. 27, 28)

105. (3)

In phaeophyceae, the gametes are pyriform (pear-shaped) and bear two laterally attached flagella. The common forms are *Ectocarpus*, *Dictyota*, *Laminaria*, *Sargassum* and *Fucus*.

(NEW NCERT 11th Page No. 27, 28)

106. (3)

In some plants, like grass, *Monstera* and the banyan tree, roots arise from parts of the plant other than the radicle and are called adventitious roots.

(NEW NCERT 11th Page No. 58)

107. (4)

In alternate type of phyllotaxy, a single leaf arises at each node in alternate manner, as in china rose, mustard and sun flower plants. In opposite type, a pair of leaves arise at each node and lie opposite to each other as in *Calotropis* and guava plants.

(NEW NCERT 11th Page No. 61)

108. (1)

The stomatal aperture, guard cells and the surrounding subsidiary cells are together called stomatal apparatus. Trichomes are a part of epidermal tissue system.

(NEW NCERT 11th Page No. 72)

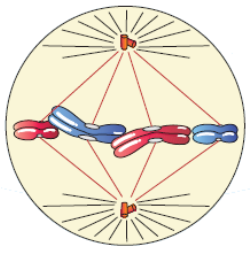
109. (3)

In the monocotyledons, the vascular bundles have no cambium present in them. Hence, since they do not form secondary tissues they are referred to as closed.

(NEW NCERT 11th Page No. 73)

110. (2)

Metaphase- Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle fibres to both poles.



Metaphase

(NEW NCERT 11th Page No. 123)

111. (1)

The eukaryotes include all the protists, plants, animals and fungi. In eukaryotic cells there is an extensive compartmentalization of cytoplasm through the presence of membrane bound organelles.

(NEW NCERT 11th Page No. 91)

112. (4)

In some organisms karyokinesis is not followed by cytokinesis as a result of which multinucleate condition arises leading to the formation of syncytium.

(NEW NCERT 11th Page No. 124)

113. (1)

The bundle sheath cells are rich in an enzyme ribulose bisphosphate carboxylase-oxygenase (RuBisCO), but lack PEPcase. Thus, the basic pathway that results in the formation of the sugars, the Calvin pathway, is common to the C_3 and C_4 plants.

(NEW NCERT 11th Page No. 146, 147)

114. (4)

The NADP reductase enzyme is located on the stroma side of the membrane. Along with electrons that come from the acceptor of electrons of PS I, protons are necessary for the reduction of $NADP^+$ to $NADPH + H^+$. These protons are also removed from the stroma of the chloroplast.

(NEW NCERT 11th Page No. 140, 141)

115. (1)

Glycolysis	Partial oxidation of glucose in all organisms
Fermentation	Incomplete oxidation of glucose under anaerobic conditions
Aerobic respiration	Complete oxidation of organic substances in the presence of oxygen
Electron transport system	The electron passes from one carrier to another

(NEW NCERT 11th Page No. 156, 157, 158, 159)

116. (2)

In glycolysis, ATP is utilised at two steps: first in the conversion of glucose into glucose 6-phosphate and second in the conversion of fructose 6-phosphate to fructose 1, 6-bisphosphate.

(NEW NCERT 11th Page No. 156)

117. (1)

Auxins help to prevent fruit and leaf drop at early stages but promote the abscission of older mature leaves and fruits.

(NEW NCERT 11th Page No.175)

118. (2)

Majority of insect-pollinated flowers are large, colourful, fragrant and rich in nectar. When the flowers are small, a number of flowers are clustered into an inflorescence to make them conspicuous. Animals are attracted to flowers by colour and/or fragrance. To sustain animal visits, the flowers have to provide rewards to the animals. Nectar and pollen grains are the usual floral rewards.

(NEW NCERT 12th Page No. 14)

119. (3)

Nucellus = 2n
Integuments =2n
Synergids = n
Megaspore mother cell = 2n

(NEW NCERT 12th Page No. 10, 11)

120. (2)

Mendel conducted artificial pollination/cross pollination experiments using several true-breeding pea lines. A true breeding line is one that, having undergone continuous self-pollination, shows the stable trait inheritance and expression for several generations.

(NEW NCERT 12th Page No. 54)

121. (2)

A single gene can exhibit multiple phenotypic expression. Such a gene is called a pleiotropic gene.

(NEW NCERT 12th Page No. 69)

122. (1)

Anaphase I: The homologous chromosomes separate, while sister chromatids remain associated at their centromeres.

(NEW NCERT 11th Page No. 127)

123. (4)

In RNA, every nucleotide residue has an additional –OH group present at 2'-position in the ribose. Also, in RNA the uracil is found at the place of thymine. The bases in two strands are paired through hydrogen bond (H-bonds) forming base pairs (bp). Adenine forms two hydrogen bonds with Thymine from opposite strand and vice-versa.

(NEW NCERT 12th Page No. 81)

124. (2)

The RNA polymerase II transcribes precursor of mRNA, the heterogeneous nuclear RNA (hnRNA).

(NEW NCERT 12th Page No. 95)

125. (3)

Polymorphisms are inheritable from parents to children. DNA fingerprinting is the basis of paternity testing, in case of disputes.

(NEW NCERT 12th Page No. 105)

126. (3)

The *lac* operon consists of one regulatory gene (the *i* gene – here the term *i* does not refer to inducer, rather it is derived from the word inhibitor) and three structural genes (*z*, *y*, and *a*). The *i* gene codes for the repressor of the *lac* operon. The *z* gene codes for beta-galactosidase. The *y* gene codes for permease. The *a* gene encodes a transacetylase.

(NEW NCERT 12th Page No. 100)

127. (2)

Saccharomyces cerevisiae	Ethanol
Streptococcus	Streptokinase
Trichoderma polysporum	Cyclosporin A
Monascus purpureus	Statins

(NEW NCERT 12th Page No. 153)

128. (1)

Resource (food and space) availability is obviously essential for the unimpeded growth of a population. Since, resources for growth for most animal populations are finite and become limiting sooner or later, the logistic growth model is considered a more realistic one.

(NEW NCERT 12th Page No. 194, 195)

129. (1)

In most ecosystems, all the pyramids, of number, of energy and biomass are upright, i.e., producers are more in number and biomass than the herbivores, and herbivores are more in number and biomass than the carnivores. Also energy at a lower trophic level is always more than at a higher level.

(NEW NCERT 12th Page No. 213)

130. (4)

Funaria, *Polytrichum* and *Sphagnum*	Dominant phase in the life cycle is gametophytic plant body
Horsetails and ferns	Dominant phase in the life cycle is the sporophytic plant body
Gymnosperms	Male and the female gametophytes do not have an independent free-living existence
Laminaria, *Sargassum* and *Fucus*	The gametes are pyriform (pear-shaped)

(NEW NCERT 11th Page No. 27, 29, 30, 33)

131. (3)

Many species extinctions in the last 500 years (Steller's sea cow, passenger pigeon) were due to overexploitation by humans.

(NEW NCERT 12th Page No. 223)

132. (3)

Ex situ Conservation– In this approach, threatened animals and plants are taken out from their natural habitat and placed in special setting where they can be protected and given special care. Zoological parks, botanical gardens and wildlife safari parks serve this purpose.

(NEW NCERT 12th Page No. 225)

133. (3)

There is a characteristic distribution of the cells within the embryo sac. Three cells are grouped together at the micropylar end and constitute the egg apparatus. The egg apparatus, in turn, consists of two synergids and one egg cell. Three cells are at the chalazal end and are called the antipodals.

(NEW NCERT 12th Page No. 11)

134. (3)

Ethylene promotes rapid internode/petiole elongation in deep water rice plants.

(NEW NCERT 11th Page No. 177)

135. (3)

The splitting of water is associated with the PS II. When the two photosystems work in a series, first PS II and then the PS I, a process called non-cyclic photo-phosphorylation occurs.

(NEW NCERT 11th Page No. 138, 139, 140)

SECTION-B

136. (4)

In a typical nucleus, some region of chromatin are loosely packed (and stains light) and are referred to as euchromatin. The chromatin that is more densely packed and stains dark are called as heterochromatin.

(NEW NCERT 12th Page No. 84)

137. (3)

In eukaryotes, the monocistronic structural genes have interrupted coding sequences – the genes in eukaryotes are split. The coding sequences or expressed sequences are defined as exons. Exons are said to be those sequences that appear in mature or processed RNA. The exons are interrupted by introns. Introns or intervening sequences do not appear in mature or processed RNA.

(NEW NCERT 12th Page No. 93)

138. (3)

Parasitism	Ticks on dogs
Commensalism	Barnacles growing on the back of a whale
Mutualism	Mycorrhizae
Competition	Abingdon tortoise in Galapagos islands became extincted due to introduction of goats

(NEW NCERT 12th Page No. 199, 200, 201)

139. (2)

The historic Convention on Biological Diversity ('The Earth Summit') held in Rio de Janeiro in 1992, called upon all nations to take appropriate measures for conservation of biodiversity and sustainable utilisation of its benefits. In a follow-up, the World Summit on Sustainable Development held in 2002 in Johannesburg, South Africa.

(NEW NCERT 12th Page No. 225)

140. (3)

Haemophilia is a sex-linked recessive disease. Phenylketonuria is an inborn error of metabolism is also inherited as the autosomal recessive trait.

(NEW NCERT 12th Page No. 73, 74, 75)

141. (2)

Gibberellins	Speed up the malting process in brewing industry
Cytokinin	Promote nutrient mobilisation
Ethylene	Breaks seed and bud dormancy
Abscisic acid	Stimulates the closure of stomata

(NEW NCERT 11th Page No. 176, 177)

142. (1)

When fats are used in respiration, the RQ is less than 1. Calculations for a fatty acid, tripalmitin, if used as a substrate is shown:

$$2(C_{51}H_{98}O_6)+145O_2 \longrightarrow 102CO_2+98H_2O+\text{energy}$$

Tripalmitin

$$RQ=\frac{102CO_2}{145O_2}=0.7$$

(NEW NCERT 11th Page No. 164)

143. (4)

Xenogamy – Transfer of pollen grains from anther to the stigma of a different plant. This is the only type of pollination which during pollination brings genetically different types of pollen grains to the stigma.

(NEW NCERT 12th Page No. 12)

144. (2)

Centrosome is an organelle usually containing two cylindrical structures called centrioles. The centrioles form the basal body of cilia or flagella, and spindle fibres that give rise to spindle apparatus during cell division in animal cells.

(NEW NCERT 11th Page No. 99, 100)

145. (3)

Sexual reproduction takes place through fusion of two gametes. These gametes can be flagellated and similar in size (as in *Ulothrix*) or non-flagellated (non-motile) but similar in size (as in *Spirogyra*). Such reproduction is called isogamous.

(NEW NCERT 11th Page No. 24)

146. (3)

If the margins of sepals or petals overlap one another but not in any particular direction as in *Cassia* and gulmohur, the aestivation is called imbricate.

(NEW NCERT 11th Page No. 64)

147. (4)

The phloem parenchyma is absent, and water-containing cavities are present within the vascular bundles of a monocot stem.

(NEW NCERT 11th Page No. 76)

148. (1)

While each of the membranous organelles is distinct in terms of its structure and function, many of these are considered together as an endomembrane system because their functions are coordinated. The endomembrane system include endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles.

(NEW NCERT 11th Page No. 95)

149. (2)

During zygotene stage chromosomes start pairing together and this process of association is called synapsis. Such paired chromosomes are called homologous chromosomes. Electron micrographs of this stage indicate that chromosome synapsis is accompanied by the formation of complex structure called synaptonemal complex. The complex formed by a pair of synapsed homologous chromosomes is called a bivalent or a tetrad.

(NEW NCERT 11th Page No. 126)

150. (1)

Since there are three different alleles, there are six different combinations of these three alleles that are possible, and therefore, a total of six different genotypes of the human ABO blood types.

(NEW NCERT 12th Page No. 61)

(ZOOLOGY)

SECTION-A

151. (1)

Improved programmes covering wider reproduction-related areas are currently in operation under the popular name 'Reproductive and Child Health Care (RCH) programmes'.

(NEW NCERT 12th Page No. 42)

152. (2)

The neural system provides an organised network of point-to-point connections for a quick coordination. The endocrine system provides chemical integration through hormones.

(NEW NCERT 11th Page No. 230)

153. (2)

α-helix and β-pleated sheet are secondary structures of proteins. This structure arises due to the regular folding of the backbone of the polypeptide chain due to hydrogen bonding between –CO group and –NH groups of the peptide bond.

(NEW NCERT 11th Page No. 112)

154. (3)

EcoRI comes from *Escherichia coli* RY 13. In EcoRI, the letter 'R' is derived from the name of strain. Roman numbers following the names indicate the order in which the enzymes were isolated from that strain of bacteria.

(NEW NCERT 12th Page No. 165)

155. (2)

Contraction of smooth muscles of the bladder and simultaneous relaxation of the urethral sphincter causing the release of urine. The process of release of urine is called micturition and the neural mechanisms causing it is called the micturition reflex.

(NEW NCERT 11th Page No. 213)

156. (4)

The SAN generates an action potential which stimulates both the atria to undergo a simultaneous contraction – the atrial systole. This increases the flow of blood into the ventricles from atria by about 30 per cent.

(NEW NCERT 11th Page No. 199, 202)

157. (3)

Hormones which interact with intracellular receptors are steroid hormones (e.g., cortisol, testosterone, estradiol and progesterone) and iodothyronines (thyroid hormones) etc. Glucagon does not interact with intracellular receptors.

(NEW NCERT 11th Page No. 248)

158. (3)

The species which had already being extinct are Therapsids, Pelycosaurs and *Tyrannosaurus*. Tuataras is currently present in living condition on earth.

(NEW NCERT 12th Page No. 123)

159. (1)

rop codes for the proteins involved in the replication of the plasmid. Origin of replication (ori) is a sequence from where replication starts and any piece of DNA when linked to this sequence can be made to replicate within the host cells. Normally, the genes encoding resistance to antibiotics such as ampicillin, chloramphenicol, tetracycline or kanamycin, etc., are considered useful selectable markers for *E. coli.* Hind III, EcoR I, BamH I, Sal I, Pvu II, Pst I, Cla I are restriction site in pBR322.

(NEW NCERT 12th Page No. 169)

160. (1)

Some specialised cells in our body like macrophages and leucocytes in blood exhibit amoeboid movement.

(NEW NCERT 11th Page No. 218)

161. (2)

By the end of 12 weeks (first trimester), most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed.

(NEW NCERT 12th Page No. 38)

162. (3)

RNA*i* takes place in all eukaryotic organisms as a method of cellular defense. This method involves silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevents translation of the mRNA (silencing). Transgenic mice are being used to test the safety of the polio vaccine.

(NEW NCERT 12th Page No. 180, 184)

163. (2)

In dense irregular connective tissue, fibres and fibroblasts are present. Orientation of fibres show irregular pattern. This tissue is present in the skin. Fibres are mostly collagen.

(**Old NCERT 11th Page No. 103)**

164. (3)

The possible ill-effects of various contraceptive methods are nausea, abdominal pain, breakthrough bleeding, irregular menstrual bleeding or even breast cancer.

(**NEW NCERT 12th Page No. 46)**

165. (4)

The opening between the left atrium and the left ventricle is guarded by a valve formed of two muscular flaps or cusps, the bicuspid valve. This valve is also known as mitral valve.

(**NEW NCERT 11th Page No. 198)**

166. (2)

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. It does not decreases respiratory surface.

(NEW NCERT 11th Page No. 190)

167. (2)

In addition to 'ori', the vector requires a selectable marker, which helps in identifying and eliminating non- transformants and selectively permitting the growth of the transformants.

(NEW NCERT 12th Page No. 169)

168. (1)

The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation.

(NEW NCERT 12th Page No. 117)

169. (2)

The flower tops, leaves and the resin of *Cannabis* plant are used in various combinations to produce marijuana, hashish, charas and ganja. Generally taken by inhalation and oral ingestion, these are known for their effects on cardiovascular system of the body.

(**NEW NCERT 12th Page No. 143)**

170. (1)

Mollusca is the second largest animal phylum. Examples: *Pila* (Apple snail), *Pinctada* (Pearl oyster), *Sepia* (Cuttlefish), *Loligo* (Squid), *Octopus* (Devil fish), *Aplysia* (Sea- hare), *Dentalium* (Tusk shell) and *Chaetopleura* (Chiton).

Laccifer belongs to phylum Arthropoda. *Echinus* belongs to phylum Echinodermata. *Hirudinaria* belongs to phylum Annelida.

(NEW NCERT 11th Page No. 44, 45)

171. (2)

In cockroaches, forewings arise from mesothorax and hindwings arise from metathorax. Forewings (mesothoracic) called tegmina are opaque dark and leathery and cover the hind wings when at rest. The hind wings are transparent, membranous and are used in flight.

(**Old NCERT 11th Page No. 112)**

172. (2)

The atrium and the ventricle of the same side are separated by a thick fibrous tissue called the atrio-ventricular septum. Atria are small chamber whereas ventricles are large chamber. Pericardium are double walled membranous bag like structure. Chordae tendineae is present in ventricle of heart.

(NEW NCERT 11th Page No. 198)

173. (3)

The thyroid gland is composed of two lobes which are located on either side of the trachea. Both the lobes of thyroid gland are interconnected with a thin flap of connective tissue called isthmus.

(NEW NCERT 11th Page No. 242)

174. (1)

Skin on our body is the main physical barrier which prevents entry of the micro-organisms. Acid in the stomach, saliva in the mouth, tears from eyes–all prevent microbial growth.

(NEW NCERT 12th Page No. 134)

175. (3)

The pathway of transformation from substrate to product must go through so called transition state structure. The intermediate altered structural states between substrate and product are unstable.

(NEW NCERT 11th Page No. 115)

176. (3)

The most recent ancestor of crocodiles are Thecodonts. Ancestor of thecodonts are Sauropsids. Ancestor of Saurpsids are early reptiles.

(NEW NCERT 12th Page No. 123)

177. (2)

Pheretima are metamerically segmented. They have closed circulatory system and does not show metagenesis. It contains nerve cell. *Physalia* are not metamerically segmented. Circulatory system is absent, show metagenesis. They have nerve cell.

(NEW NCERT 11th Page No. 41, 43)

178. (2)

The autonomic neural system is responsible for transmitting impulses from the CNS to the involuntary organs and smooth muscles of the body, regulating functions such as heart rate, digestion, and respiratory rate.

(**NEW NCERT 11th Page No. 231)**

179. (3)

Each seminiferous tubule is lined on its inside by two types of cells called male germ cells (spermatogonia) and Sertoli cells. The male germ cells undergo meiotic divisions finally leading to sperm formation, while Sertoli cells provide nutrition to the germ cells.

(**NEW NCERT 12th Page No. 27)**

180. (2)

The use of alcohol during adolescence may also have long-term effects. It could lead to heavy drinking in adulthood. The chronic use of drugs and alcohol damages nervous system and liver **(**cirrhosis).

(NEW NCERT 12th Page No. 146)

181. (3)

Muscle is a specialised tissue of mesodermal origin. About 40-50 per cent of the body weight of a human adult is contributed by muscles. Iris muscles, ciliary muscles and arrector pili muscle are ectodermal in origin.

(NEW NCERT 11th Page No. 218)

182. (1)

Each haemoglobin molecule can carry a maximum of four molecules of O_2. Nearly 20-25 per cent of CO_2 is transported by RBCs whereas 70 per cent of it is carried as bicarbonate. About 7 per cent of CO_2 is carried in a dissolved state through plasma. Lymphocytes constitute 20-25% of total WBC.

(NEW NCERT 11th Page No. 189, 195)

183. (2)

In some animals, the body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called pseudocoelom and the animals possessing them are called pseudocoelomates**,** e.g., Aschelminthes i.e., filarial worm and hookworm etc.

(NEW NCERT 11th Page No. 39)

184. (1)

The reproductive cycle in the female primates (e.g. monkeys, apes and human beings) is called menstrual cycle. The first menstruation begins at puberty and is called menarche. In human females, menstruation is repeated at an average interval of about 28/29 days, and the cycle of events starting from one menstruation till the next one is called the menstrual cycle.

(**NEW NCERT 12th Page No. 33)**

185. (3)

The hyperosmolarity in the inner medullary interstitium creates an osmotic gradient that drives the reabsorption of water from the renal tubules, particularly in the collecting ducts. This reabsorption of water allows for the formation of concentrated urine, ultimately regulating body fluid balance and conserving water.

(**NEW NCERT 11th Page No. 212)**

SECTION-B

186. (1)

Abrin and Ricin are toxins. Many of secondary metabolites are useful to 'human welfare' (e.g., rubber, drugs, spices, scents and pigments). Morphine and codeine are alkaloids. Carotenoids and Anthocyanins are pigments.

(NEW NCERT 11th Page No. 108)

187. (1)

Lactational amenorrhea method has been reported to be effective only upto a maximum period of six months i.e., 24 weeks following parturition. The zygote or early embryos (with upto 8 blastomeres) can be transferred into the fallopian tube via ZIFT–zygote intra fallopian transfer technique.

(NEW NCERT 12th Page No. 44, 48)

188. (4)

Human heart is autoexcitable, its functions can be moderated by neural and hormonal mechanisms. Heart is myogenic in nature.

(NEW NCERT 11th Page No. 204)

189. (1)

Skeletal system consists of a framework of bones and a few cartilages. This system has a significant role in movement shown by the body. Production of body heat is not a function of skeletal system.

(NEW NCERT 11th Page No. 224)

190. (2)

The convention for naming these enzymes is the first letter of the name comes from the genus and the second two letters come from the species of the prokaryotic cell from which they were isolated. Roman numbers following the names indicate the order in which the enzymes were isolated from that strain of bacteria.

(NEW NCERT 12th Page No. 166)

191. (3)

CO_2 is carried by haemoglobin as carbamino-haemoglobin (about 20-25 per cent). This binding is related to the partial pressure of CO_2. When pCO_2 is high, pO_2 is low and high temperature as in the tissues, more binding of carbon dioxide occurs whereas, when the pCO_2 is low and pO_2 is high as in the alveoli, dissociation of CO_2 from carbamino-haemoglobin takes place, i.e., CO_2 which is bound to haemoglobin from the tissues is delivered at the alveoli.

(NEW NCERT 11th Page No. 189)

192. (3)

Saccoglossus belongs to phylum Hemichordata, in which development is indirect. *Ophiura* belongs to phylum Echinodermata in which development is indirect with free swimming larva. Sexes are not separate in *Planaria*.

(NEW NCERT 11th Page No. 42, 45)

193. (1)

List-I	List-II
Anthropogenic action	Herbicide resistance
Stabilising selection	Average weight of human child during birth
Adaptive radiation	Darwin's finches
Dark-winged moths	Industrial melanism

(NEW NCERT 12th Page No. 116, 121)

194. (4)

Male frogs can be distinguished by the presence of sound producing vocal sacs and also a copulatory pad on the first digit of the fore limbs which are absent in female frogs.

(**NEW NCERT 11th Page No. 81)**

195. (2)

Oxytocin acts on the smooth muscles of our body and stimulates their contraction. In females, it stimulates a vigorous contraction of uterus at the time of child birth, and milk ejection from the mammary gland.

(NEW NCERT 11th Page No. 242)

196. (2)

The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus and forms 2, 4, 8, 16 daughter cells called blastomeres. The embryo with 8 to 16 blastomeres is called a morula. Implantation occurs at 32 celled stage called blastocyst and leads to pregnancy.

(NEW NCERT 12th Page No. 36, 37)

197. (4)

List-I	List-II
Epidermophyton	Ringworms
Wuchereria	Elephantiasis
Salmonella	Typhoid
Streptococcus	Pneumonia

(NEW NCERT 12th Page No. 130, 131)

198. (1)

Insulin used for diabetes was earlier extracted from pancreas of slaughtered cattle and pigs. Insulin from an animal source, though caused some patients to develop allergy or other types of reactions to the foreign protein.

(NEW NCERT 12th Page No. 181)

199. (3)

The ionic gradients across the resting membrane are maintained by the active transport of ions by the sodium-potassium pump which transports $3Na^+$ outwards for $2K^+$ into the cell.

(NEW NCERT 11th Page No. 232)

200. (2)

PCT causes maximum reabsorption. Nearly all of the essential nutrients, and 70-80 per cent of electrolytes and water are reabsorbed by this segment. Reabsorption is minimum in ascending limb of loop of Henle.

(NEW NCERT 11th Page No. 209)

■■■

PW Web/App - https://smart.link/7wwosivoicgd4

Library- https://smart.link/sdfez8ejd80if